THE BUILDING TRADES' EXHIBITION.

A GENERAL IMPRESSION.

Enterprise, energy, and a vast stock of valuable materials have gone to the making of the newly-opened Exhibition in the Great Hall at Olympia, where all sorts of different commodities, from art-tiles to concrete-mixers, combine to produce the most astonishing effect of lavish profusion. Despite all difficulties, the Exhibition shows signs of exceeding in interest those that have gone before in that new methods and materials have been brought to an unprecedented state of perfection, thanks to the high prices which have made it worth while to continue to experiment. Whatever political or financial considerations may have contributed to the housing shortage, a visitor would not gather that lack of material had anything to do with it, and it is to be hoped that the plenty within is a fair indication of plenty without the walls of the Exhibition.

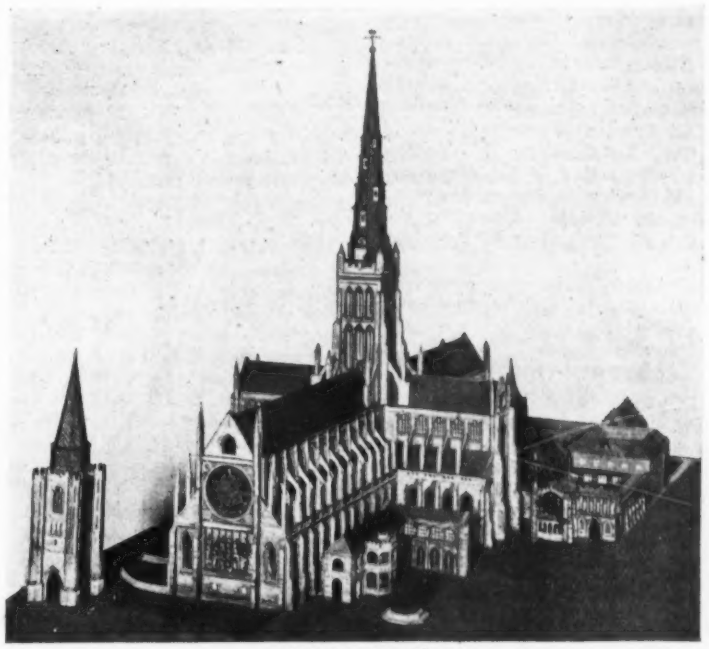
Viewed from either of the main entrances, the enormous quantities of building material stacked up on all sides banish the thought of hard times and trade depression.

A closer inspection shows that every available space has been equally crowded with excellent and costly products, some in a raw and others in a highly developed stage of production, and some finished and ready for erection. Some exhibitors, not content with the display of samples, have turned their stalls into timber yards, and have stacked the sawn-up products of many whole tree-trunks on racks reaching several feet from the ground, as if to demonstrate that they are prepared to deliver instantly goods from stock. That is undoubtedly the impression which the exhibitors wish to convey. A slight fall in the cost of living brings with it the opportunity and the need for a brisker turnover, and spurs both manufacturer and merchant to take active measures in self-defence. These measures, as might be expected, generally tend to manifest themselves on individualistic lines, and each stall is most usually a complete unit in itself, commercially and artistically considered, with "no connection with any other firm."

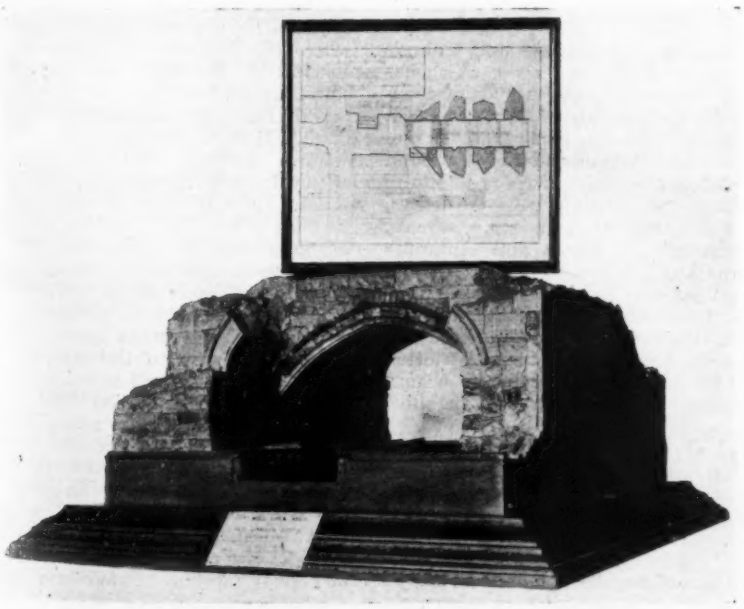
From the point of view of the visitor seeking to acquire technical information as to the uses and prices of commodities, it may not seem of vital importance whether the stalls are rivals and individual or co-operative and collectionist, but in some ways even the visitor would be benefited if it could be found possible for several firms to unite in producing a super-stand in the centre of the hall where the effect of several materials and products could be viewed in conjunction with one another as in an actual building. This course has been followed in a minor way in those department stores where furnished suites of rooms are shown which really help the intending purchaser to learn what he wants and what he can afford. One of the greatest difficulties in the path of those who have either to design or to order and pay for buildings is the lack of opportunity to connect the finished work with the materials out of which it is to be produced.

A building exhibition in which the exhibitors collaborated on a central feature would provide just such an opportunity of seeing in the same view both the end to be attained and the means of its attainment.

Such collaboration has been proved to be perfectly feasible if the arrangements are well considered in advance and the parties to the combination could share the rights of the structure for stand purposes, each having a lock-up den and the right to guide visitors through the whole of those parts which are open to the public.



Old St. Paul's
[From a model on *The Builder* Stand.]



The Recently-discovered Arch of Old London Bridge.
[From a model on *The Builder* Stand.]

The present Exhibition, however, is riotously individualistic. Every stall-holder whose goods can be housed in a covered stand has erected one of a different pattern from those of his neighbours.

Large printing on the fascias proclaims the name of the stall to anyone who can get into a position to read it, and each narrow avenue is bordered by a series of huts of exquisite finish and perfection of workmanship as regards details, but altogether lacking in what should be the first considerations of orderly balance in mass and arrangement.

The great span of the Hall is not unworthy of notice, and, even if it were altogether hideous, the posing of objects on its floor without any consideration for symmetry could hardly be expected to improve matters.

As it is, the shape of the Hall roof goes for nothing; for a visitor does not realise it, and goes wandering on into the low-roofed annexe without being aware when he crosses from one to the other. To desire an orderly scheme is not merely an artistic whim, for it is to the practical pecuniary interest of every exhibitor that each visitor should be spared the strain and loss of time which is put upon him by the effort to find his way about, and in which the guidance afforded by the general lines of the Hall might be pressed into service by judicious planning.

In one or two cases exhibits have been placed on the floor without any erection or "stand" above them. This arrangement permits of a much wider view; and an exhibition in which the plots on each side of the main alleys were laid out to be occupied by exhibits that did not rise above eye level would attain to a high degree of visibility, and allow the exhibits to reveal themselves in all their undoubted interest of detail.

The Atelier competition for a lay-out of an exhibition, illustrated in a recent issue of this journal, shows how a great degree of order might be introduced without undue interference with the accepted independent methods of procedure.

THE STANDS.

THE Stand of *The Builder*, Ltd., is No. 118, Row F, where a special feature is made of three models of considerable interest. One depicts Old St. Paul's, and another is Old London Bridge, reconstructed after a drawing by the late H. W. Brewer. A model is also on view of the arch of Old London Bridge, recently discovered at the City end in the course of excavating for the foundations of Adelaide House; special interest attaches to this model in view of the efforts now being made for the preservation of the arch. By means of a new type of optical lantern a series of architectural illustrations is being shown on a screen. There is also displayed a selection of books of interest to architects and builders, including "Old London Illustrated," by Mr. Herbert A. Cox, F.C.A., *The Builder* Portfolio of Cathedrals, and *The Builder* Map of the County of London, showing Surveyors' Districts under the Building Act. The three models were made by Messrs. Partridge's Models, Ltd.

On this and the following pages we cover a number of the stands, and further notices will be given next week.

CONSTRUCTION.

Throughout history works of architecture have been divided into two distinct classes, the permanent and the temporary, and when we look back to the substantial and enduring bulk of certain monuments of antiquity we are inclined to forget that the great part of mankind has always been housed in flimsy structures of a definitely cheap and evanescent character. In our own day and country the by-laws of urban and rural districts have tended to produce average results by enforcing a minimum standard of solidity in all constructions. Great buildings with us are built in a far less substantial manner than was the case in antiquity, but, on the other hand, small cottages on leasehold plots are condemned to conform to the same standard as applies to freehold structures and are of what has been described as a "semi-permanent" nature. The desire to build as cheaply as is compatible with by-laws has resulted in the production of many materials and methods of construction which aim at filling this need. It is not that the old materials and methods are deficient in either structural or æsthetic possibilities, but that they are sometimes felt to be too costly to be employed economically in practical modern house construction. Actual results, however, are extremely contradictory; local facilities affect the question, and a house may be built in brick in a favoured district cheaper than in concrete if suitable materials are not available on the site and transport is difficult and costly. Brick construction is old and tried and its methods have the advantage of being thoroughly familiar to all concerned. New methods, however sound and economical when put into operation by expert workmen, labour under the disadvantage of their own novelty when it is a question of using them for the first time under the conditions of ordinary practice. Inventors and manufacturers have an uphill fight, and in general the fact that a material or method has been successfully established is a real triumph of sound quality and economic suitability for purpose. As is seen by the exhibits, however, concrete has already firmly established itself for certain purposes, and we would draw attention to the exhibits of concrete blocks treated with colour on the surface.

The stand of MESSRS. BELL'S UNITED ASBESTOS CO., LTD., of Southwark-street, S.E.1 (No. 87, Row E), takes the form of a pavilion, demonstrating on the roof the uses of the firm's well-known products: the utility and excellent artistic effects which may be obtained with the various forms of "Poilite" roofing, namely "Poilite" standard diagonal tiles, in red, grey, and russet-brown colours; corrugated sheets; pantiles; and Roman tiles. "Poilite" asbestos-cement sheets for wall construction of a permanent character are shown in the sides of the building. One of the claims of this material is that it dispenses with the services of the plasterer and the interior of the pavilion shows the excellent effects which may be obtained without the aid of that *rara avis*. Many other uses of this material are to be seen on the stand, which forms a comprehensive exhibition of asbestos-cement products and their varied uses.

The stand of MESSRS. JOHN BOOTH & SONS, of Bolton (No. 35, Row C), demonstrates in a practical manner the utility of structural steelwork. The roof is a half-size model of Booth's Warren-girder roofs, representing Warren girders of 50 ft. span, spaced 20 ft. apart, with valley girders and intermediate trusses. Two bays are glazed with Hope's patent glazing, one bay covered with boards and felt, and provided with Booth's pressed "rustless iron" gutters. These roofs have been used at the Dunlop Rubber Co.'s new sheds and mills at Castleton, covering an area of 40,000 sq. yds. Steel fireproof doors and steel and glass partitions are also shown.

A "sound-deadened" room, exhibited on Stand No. 59, Row D, by MESSRS. BUILDING PRODUCTS, LTD. (44–46, King's-road, S.W. 3) is attracting considerable attention. The silence in this room, which is insulated by means of Cabot's quilt, provides a striking contrast compared with the noise of the general hall. Cabot's quilt is composed of cured eel-grass, which has a tough flat fibre and forms thousands of dead-air spaces. The quilt is claimed to be rot-proof, vermin-proof, and strongly fire-resistant, and as efficient as a heat insulator as it is as a sound deadener. It has been used in many buildings of various classes, including private residences, factories, cold storage buildings, schools, hospitals, hotels, and Arctic and Antarctic exploration huts. This firm also show samples of their well-known specialities for waterproofing and hardening concrete, brick, stone, &c., in both liquid and paste form, and the 'Rigifix" bolt hanger sockets and slotted inserts for embedding in ferro-concrete beams, in order to obviate cutting away when installing machinery.

The varied use of asbestos cement products are well demonstrated on the stand of the BRITISH FIBROCEMENT WORKS, LTD., of 22, Laurence Pountney-lane, E.C. 4 (No. 134, Row G.), in the construction of which the products of the firm ("Fibrent") are shown in numerous forms. In the roof may be seen flat and curved corrugated sheeting in natural grey colour, red and grey diagonal sheets, blue-black "Duchess" slates, and scalloped slates. Flat, corrugated and ribbed sheets are used for the exterior of the walls, part of which is finished in half-timber. Half-inch sheets, fixed direct to the joists, are used for the floors. An attractive interior is obtained by the use of flat sheets in various finishes. This fire-resisting material is easily handled and fixed, and is now being used in large quantities.

A Garden Room. MR. J. SYDNEY BROCKLESBY, A.R.I.B.A., Architect.
[The Stand of MESSRS. W. G. TARRANT, LTD.]

MESSRS. THE CRITTALL MANUFACTURING CO., LTD. (Braintree), show on stand No. 143, Row G., a complete range of their well-known window products, including windows suitable for practically any class of building. The exhibits show many innovations in design, including bronze threshold plates and special fasteners for folding doors. Amongst the novelties included in this exhibit is a new design of shutter for use in conjunction with metal windows, in which the slats are of teak, placed in metal frames, thus overcoming the difficulty of shrinkage in the woodwork and at the same time avoiding the objection to steel slats, which become overheated in tropical countries. Another interesting feature is the "Fenestra" panelling, consisting of the application of various kinds of wood slabs to metal frames. This may be used either as a wall covering or as a partition, in which case the wood may be replaced either by asbestos for fire-resisting purposes or by glass where the problem of illumination has to be considered. Amongst other exhibits on this stand are various types of bronze doors which this firm are now making for the New London County Hall, to the design of the architects.

Much interest is attached to the exhibit of the DIAMOND TREAD CO., LTD. (28, Victoria-street, London, S.W.1) on stall, No. 181, Row J. The "L" section treads (full size) in aluminium or brass framing, filled with patent non-slipping material, are eminently suitable for hotels, shops and restaurants, and are designed to take the place of the plain brass nosing, having a much longer life and giving an excellent grip to the feet. The Diamond Non-slipping Tiles and Mosaics are constructed of cement and sparkling carborundum grits combined under pressure. These tiles are claimed to be indestructible, impervious to heat, cold or dampness, and make a beautiful flooring when combined with other tiling.

MESSRS. W. H. GAZE & SONS, LTD. (Kingston-on-Thames), are showing, on Stand 22A, Row B, a model of a cottage of striking outward design and great internal convenience, which demonstrates how much may be obtained for a small outlay. The firm's main exhibit shows the

treatment of a reception room, with adjoining alcove, the leading scheme of colour being red and grey, with accents of green and gold. This theme is intensified in the alcove, which is lower in tone. The outstanding novel features are the gilded reed-like sun screens, the merging of wall treatment into ceiling without cornice, while the alcove shows a new wall treatment of veneer panels with intense black bordering, which is echoed in the carpet. Other features are the hearth treatment, chimney breast, and special lighting.

The admirable qualities of the "Kleine" reinforced hollow brick floor construction, shown on Stand No. 111, Row F, by the Kleine Patent Fire-Resisting Flooring Syndicate, Ltd. (133–5, High Holborn, W.C.1), are now generally recognised, and it has been and is now being used in the erection of a large number of large buildings. The system is claimed to be superior to concrete for floor construction as regards both cost and fire-resisting qualities. It is interesting to note that after the recent conflagration at Messrs. Gliksten's timber yard practically the only erection left intact was constructed on this system.

Stand No. 38, Row C, occupied by the Moler Fireproof Brick and Partition Co., Ltd. (Vickers House, Broadway, S.W.1), is erected on the Company's patent "T" block cavity system of construction, the details of which may be clearly seen. The extra lightness of the "Moler" brick is demonstrated by a specimen floating in water. Other exhibits include partition blocks of various sizes, blocks for external walls, floor blocks for reinforced concrete floors, and different varieties of heat-insulating bricks. The many uses to which "Moler" can be put, such as gas-fire backs, backs for coal fires, chimney construction ovens, insulation, hot plates, &c., are demonstrated.

The well-known specialities of the Self-Sentering Expanded Metal Works, Ltd. (110, Cannon-street, E.C.4), which aim at economising in reinforced concrete floor, roof, and wall construction by the elimination of shuttering, are shown to advantage on Stand No. 94, Row E. For floor and roof construction, "Self-Sentering" ribbed expanded-metal reinforcement does away with the need for the use of close-boarded timber shuttering; it is interesting to note that this material has been used for the floors of all boxes, circles and galleries in the reconstructed Drury-lane Theatre, as well as the construction of the project of boxes and flat roof above them. "Trussit" corrugated expanded-metal, when plastered to a thickness of 2 in., gives an excellent outside wall or partition, and is useful for walls of dwelling-houses, factories, garages, &c., and where soundproofness has to be considered. This product has been used throughout for the walls of the new works of the Kent Port Cement Co., the Humber Portland Cement Co., &c. "Herringbone" is a rigid, expanded-metal lath for fireproof ceilings, encasing stanchions, exterior walls of bungalows, and because of its rigidity will span across a wider spacing of studding than the ordinary lath, and also requires a minimum amount of plaster.

The Siegwart Fireproof Floor Co., Ltd., of 231, Strand, W.C.2, are showing on Stand No. 1, Row A, sections of their well-known hollow fire-resisting floors, which are erected without the use of centering. The main exhibit is a floor with a span of 12 ft., from which the simplicity of construction and laying may be judged.

At Stand No. 25, Row B, a new application of asbestos cement for dadoes, ceilings, friezes, decorative panels, &c. (sold under the registered name of "Elo"), is shown by the Soc. Anon. du Fibrocement et des Revetements Elo, of Paris, whose agent in this country is Mr. A. C. Rennie, of 62, Oxford-street, W.1. This material is supplied in a variety of designs in imitation old oak, light oak, mahogany, bronze, stone, &c.

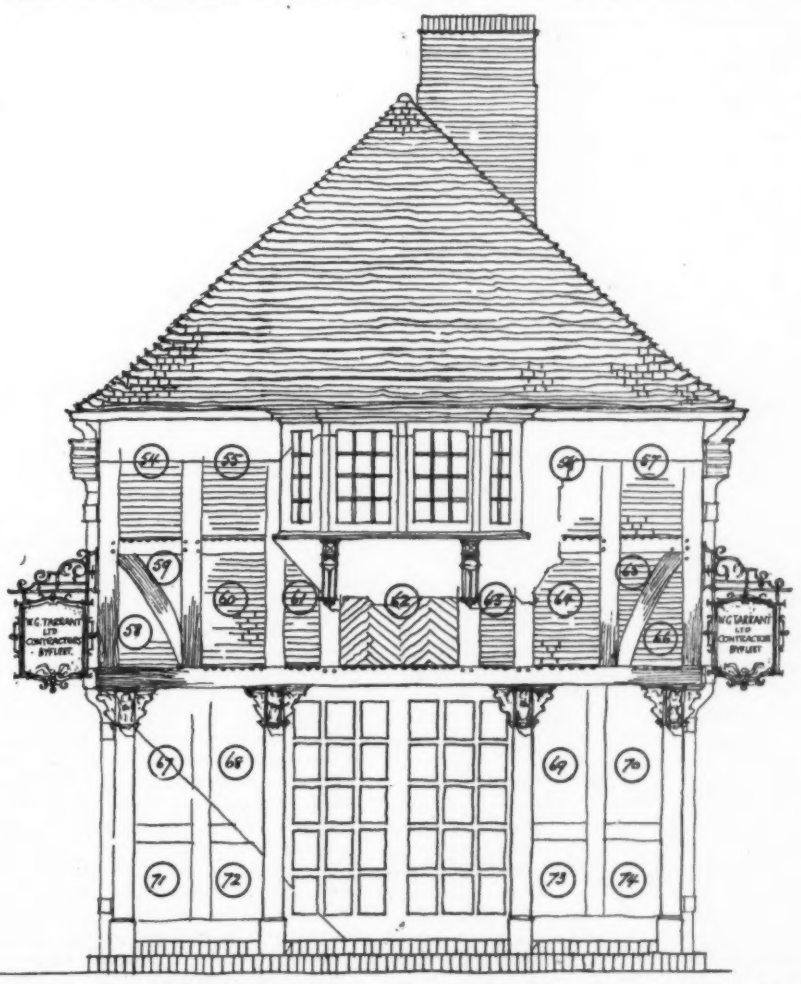
The stand of Messrs. G. R. Speaker & Co., of Stevenage-road, S.W. (No 142, Row G), forms a practical demonstration of the pleasing results to be obtained by the use of "Eternit" asbestos cement in connection with economical and durable house construction. The roof of the stand is covered with "Eternit" 12 in. tiles of dark brick-red colour, while the walls and ceilings have been lined throughout with "Eternit" sheets 8 ft. by 4 ft. by $\frac{1}{16}$ in. A gable-end is fitted with roughcast "Eternit" sheets externally. The framework is constructed on the firm's "Trellit" light steel system, the walls are channel uprights connected with horizontal steel members at 2 ft. 8 in. centres filled with wooden battens to which "Eternit" sheets are nailed. Buildings of this form of construction are supplied in assembled units of complete walls (folded for despatch) which can easily be erected by re-expanding them and inserting wind braces at suitable points. The ceiling sections are made on the same principle. The roof is of welded "Trellit" trusses, made of light channel steel in detachable sections. No special tackle is required for the erection of these buildings, and houses can be got ready for occupation in a few days.

The stand of Messrs. W. G. Tarrant, Ltd., of Byfleet, Surrey (No. 93, Row E), consists of an Elizabethan half-timber gazeba or garden room. The framework is formed of English oak and the hand-made bricks and tiles are from the well-known Rowlands Castle and Chobham brickyards. Examples of joinery manufactured at Byfleet from artifically-seasoned timbers are shown, and also English timbers that have been seasoned in steam kilns. In the upper floor are photographs of various country houses and other buildings in which these materials have formed the principal building materials. The firm is calling particular attention to a display of bricks and tiles manufactured for inglenooks and similar features.

The manufacturers of "SX" board (The Thames Paper Co., Ltd., of Purfleet, Essex) are exhibiting their well-known material on stand No. 140, Row G. The stand is chiefly designed to demonstrate the possibilities of "SX" board as a panelling material, and different styles of panelling are shown. This material is rigid and strong, and has an attractive mat surface which takes paint or distemper with excellent results. It is a convenient alternative to lath and plaster, and besides its main uses as an interior lining, it may be used for a variety of other purposes. The rapidity with which it can be erected is a strong point in its favour.

Stand No. 163, Row H, has been erected by Messrs. Turner Brothers' Asbestos Co., Ltd., of Trafford Park, Manchester, as a practical illustration of the application of asbestos cement materials, in the form of tiles and corrugated roofing and siding material, namely, "Trafford" tiles and "Aegis" roof slates and building sheets. "Trafford" tiles are manufactured to one standard size, 4 ft. long by 3 ft. 8 in. wide. These tiles have been designed to obtain the maximum flexion strength from the material with efficiency, and to give a maximum covering capacity with simplicity of fixing. The great flexion strength procured by the design allows the purlins to be spaced at 3 ft. 6 in. centres, and effects a considerable saving in roof structure. To ensure close fitting laps, the tile corrugations are tapered, and two corners of the tiles are mitred, so that where four tiles meet three thicknesses occur.

A marbolith floor, actually laid, showing various borders and designs in different colours, is the principal feature of the exhibit of the Wilfley Co., Ltd. (Salisbury House, London Wall, London, E.C.), at their stand, No. 145, Row H. The floor has concave skirting formed around the sides, demonstrating how all sharp angles are avoided. By this means it is impossible for dust or dirt to collect, and cleaning is rendered both easy and efficient. In addition, the firm is exhibiting a section of Marbolith taken from the premises of Messrs. Kolynos Incp., Aldersgate-street, E.C., after a fire which occurred there in July last year. A fire broke out in the basement, and Marbolith was laid on



A Garden Room: Side Elevation. Mr. J. Sydney Brocklesby, A.R.I.B.A., Architect. [The Stand of Messrs. W. G. Tarrant, Ltd.]

the existing boards of the ground floor. While both the joists and boards were burnt through, the Marbolith floor was not affected in any way, and was only broken through by the heavy weight of machinery upon it. While the basement of the building was entirely gutted, it was quite evident that the remainder of the building was saved by the fire-resisting properties of Marbolith.

The methods of MESSRS. WILLIAMS & WILLIAMS, LTD., makers of "Reliance" metal windows (Sardinia House, Kingsway, London, W.C.2) are demonstrated at Stall No. 138, Row G). Often one hears of a firm discarding old ideas for those created by the more progressive mind, but it is rarely that an old-established concern embarks upon such an ambitious plan of new management as is now inaugurated at Messrs. Williams & Williams. Since its earliest days, this firm has consistently followed a progressive programme, and has strictly adhered to a policy, laid down in the days of its foundation, whereby the soundness of every new plan has to be proved before it is adopted. It is claimed by Messrs. Williams & Williams that their factory and administration are now organised to a pitch which enables them to provide an even finer service to architects and builders than they have ever been able to offer before, and bearing in mind some of the past achievements of this house it would seem that it means to become still more firmly planted on the top rungs of the ladder.

"Xelstone," which is now being used to an increasing extent for the rejuvenation of old brick buildings with a stone front, is exhibited on Stand No. 62, Row D, by the XELITE PLASTER CO., LTD., of 56, Buckingham Gate, S.W.1. This material may be seen on the face of several old brick buildings in London and elsewhere, and is also used for facing concrete. It is a stone finish placed *in situ* "Xelite" plaster for interior use is also shown

CEMENT AND WATERPROOFING MATERIALS.

A necessary ingredient of tenacious mortar and of concrete construction, the quality of cement, is of the utmost importance in regard to its adhesive strength and reliability. Appearance is also worthy of consideration, for the somewhat dismal grey effect of Portland cement has been one of the drawbacks attending its use in building except in those situations in which it was hidden behind some other material, or coated over with applied pigment. A white cement is now on the market, and experiments are being made as to the effect on strength and durability of other colours mixed in cement, so that the old objection seems likely to be removed. Another improvement, much to be desired in the quality of cement, is that it should be watertight, and several preparations have been invented for hardening and water proofing structures or objects made of cement and cement concrete. The importance of a really sound waterproof cement can hardly be over-estimated, for it would be possible by its use to dispense with costly tiled or slated roofs, and to build flat roofs without a coat of asphalte, lead, or zinc. If concrete is to be really economical, it should be capable of being used throughout the whole structural framework of a building from foundation to roof, and this can only be the case with a waterproof material of high tensile trength and a considerable degree of hardness. In regard to impermeability attained by cement concrete as used in practice, longer time tests will yield, ultimately, accurate information. In the meantime, it is quite certain that manufacturers are able to make waterproof concrete with their own productions under favourable conditions. Tanks for hot liquids and chemicals have been successfully constructed, and picturesque fountain basins made to hold water within a few days of the concrete setting. Such structures are usually comparatively small, and are, therefore, not subject to defects which might be foreseen in the ordinary course of roof building, where greater spans may cause eflection and cracking, and where unequal settlement, expansion of materials, and other evils have to be feared. Waterproofing compounds are being freely specified and experiments on a large scale are proceeding, so that there is no doubt that waterproof cement will evolve at last the technique of its own successful employment. The effect of various colouring materials on cement, and a specimen of white cement, may be seen on different stands, and the properties of the various waterproofing liquids and powders are demonstrated by their respective manufacturers.

THE CEMENT MARKETING CO., LTD., of Portland House, Lloyd's-avenue, E.C. (which is the selling organisation for the Associated Portland Cement Manufacturers, Ltd., the British Portland Cement Manufacturers, Ltd., Messrs. Martin Earle & Co., Ltd., and the Wouldham Cement Co., Ltd.), have on Stand 112, Row F, an exhibition of considerable interest. The main feature is a working model of a complete Portland cement plant, which shows the process of cement manufacture from beginning to end. There are also shown samples of the companies' well-known brands of Portland cement ground to various degrees of fineness; cement at various stages of its manufacture; neat and sand briquettes of various ages, and cubes of various mixtures for testing; aggregates of various descriptions, both suitable and unsuitable for mixing with Portland cement; a complete set of testing apparatus used in connection with the revised British Standard Specification; and samples of lime, whiting, superfine Keene's and Parian cements. A simple apparatus for ascertaining the proportions of cement, sand, and course materials necessary to obtain dense concrete is on view, and practical tests are carried out on the stand.

The uses of "Pudlo" brand cement waterproofing powder are demonstrated on Stand 46, Row C., by Messrs. KERNER-GREENWOOD, LTD., of King's Lynn. Demonstrations are given with a new apparatus for testing the resistance of waterproofed cement mixtures to permeation by water under pressure up to 300 lbs. per sq. in. The pressure is directly applied by means of a hydraulic screw pump. An attachment to the machine enables waterproofed or non-waterproofed cement discs to be tested to destruction, and it is shown that discs of waterproofed cement (2 and 1 and 5 per cent. of "Pudlo" brand powder) $\frac{3}{8}$ in. thick fail by fracture at an average pressure of 110 lbs. to the sq. in., applied over a circular area 3 in. in diameter; when this occurs there is no evidence of the penetration of moisture into the substance of the waterproofed cement. The properties of the powder are also demonstrated in other ways, such as by waterproofed slabs immersed in water and subjected to running water, and by cement trays which have been treated with "Pudlo" containing oils, &c.

A microscopic examination of an ordinary concrete floor will show that it is honeycombed with innumerable small cells. When such a floor is subjected to heavy wear the walls of the cells break down and disintegrate, causing dusting and sanding. It is therefore apparent that a concrete floor, in order to stand up to heavy traffic, must be dense, compact, and homogeneous. "Ironite" flooring, if laid in strict accordance with instructions, is claimed to form a tough and wear-proof floor which is dustless, waterproof and grease-proof, being practically impervious to all kinds of oil and has been tested up to a water pressure of 124 lb. per square inch. It is designed to be mixed dry with cement and clean, crushed granite or sharp, clean sand for the floor topping. In the process of setting, by reason of the chemical action which takes place, the particles of "Ironite" flooring not only expand and tightly seal the pores and interstices, but also bond the surrounding particles in a much firmer adhesion than is ordinarily obtained with Portland cement alone. This manner of topping produces a floor as near to being wear-proof as possible. Such a floor will resist almost any crush power and tensile strain. The manufacturers, THE IRONITE CO., LTD. (managers, Messrs. S. Thornely, Mott & Vines, Ltd., of 9 and 11, Old Queen-street, Westminster, S.W.1) occupy Stand No. 102, Row F. It is interesting to note that "Ironite" and Portland cement slurry or grouting can be applied with a brush, waterproofs concrete, breeze blocks, brickwork and other porous surfaces, &c. "Ironite" waterproofing is waterproof, grease-proof and oilproof, and is used for basements, subways, heating chambers, liftwells, tanks, &c. The firm are sales representatives for the Marion steam and electric shovels, of which there are eight or ten working in this country; the Kilbourne & Jacobs automatic air dump cars, the "Wonder" concrete mixers, "Watson" bottom dumping wagons, and "Stroud" elevating graders, reversible road machines, and rag and wheel scrapers.

On Gallery Bay, 4A, MESSRS. TIDNAMS, LTD., "Rose and Crown" Hotel, Wisbech (London Office: Messrs. J. B. Corrie & Co., 15, Victoria-street, S.W.1) are showing reinforced concrete fencing posts; sign and direction posts, as approved by Ministry of Transport; Newmarket pattern concrete posts, part fitted with pales, part with weather boarding, and part with wood rails; fencing as supplied to Great Western Railway Company for permanent way; fencing pattern 12, as used for enclosing stock of all kinds; fencing pattern 10A, ditto, but less expensive; housing scheme fencing, made to Ministry of Health standard specification; reinforced concrete mangers; water troughs, heads and sills, and balustrading; and Corrie's patent fencing dropper, combined with concrete fencing. Exhibited on the same stand is "Colemanite," a liquid chemical compound. When added to the gauging water which hydrates a dry concrete mix, it produces an entirely different concrete than can be obtained without its use. Concrete in which "Colemanite" is an ingredient is stated to be of adamantine hardness and impermeable to moisture, to water or even to most acid solutions. One of its chief uses is as a hardener of floor toppings. Whether the floor topping be of sand and cement, or of cement and granite chips, the addition of "Colemanite" to the gauging water ensures that the trowelled surface will be considerably improved "Colemanite" floors will not rut, dust or flake, and they will not disintegrate under trucking conditions. There is also being shown "Atlas White" Portland cement, which is manufactured to meet the growing and widespread demand for a white non-staining Portland cement to be used for decorative purposes. "Atlas White" is white in colour, non-staining, and is a true Portland cement. Its chemical composition is practically identical with that of the finest Portland cements, except that it is free from those elements which cause the gray colour in commercial Portland cement. The strength of "Atlas White" both in tension and compression is claimed to be equal to that of the finest Portland cement.

MESSRS. THE WATEREX CO., LTD. (High Holborn, London, W.C.1), are located at gallery bay No. 15, and the chief features of the exhibit are waterproofed brick and breeze block walls, waterproofed and oil-proofed tanks made of breeze blocks, and loose sand treated with "Waterex" waterproofing, with water standing in a depression, demonstrating that "Waterex" waterproofing stops suction and capillary attraction. There are also shown standard models of hand and power pumps in operation. for handling water, paint, heavy crude fuel oil, syrups, hot tar, &c. "Waterex" floor preservative is also shown applied to concrete and wood floors.

LIFTS.

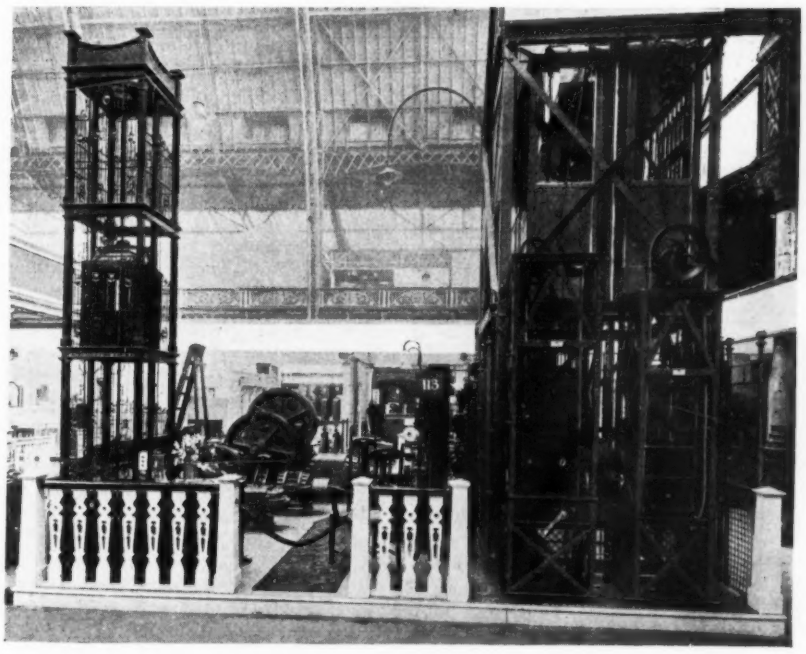
Shakespeare's Richard II likening the crown he is forced to resign to a deep well that owns "two buckets filling one another; the emptier ever dancing in the air, the other down, unseen and full of water," gives a graphic description of a primitive lift in which the principle of partial counterpoise is clearly enunciated. A still more primitive form of lift may be traced back to remote antiquity, where, in Egyptian sculptures, the balance-weighted "shadoof" is shown raising water from a lower to a higher level. Various forms of water-wheel, with an

endless chain of pitchers, bridge the gulf between ancient and modern lifts, and introduce the idea of lifts actuated by machinery, the motive power being sometimes supplied by the flow of the stream itself, though more frequently, by some domestic animal toiling around a cog-wheel. An original service lift seems to have been provided in a Scotch mansion remodelled about 1685, but the practice of dining on the same floor as the kitchen prevented their common use. Hatches between servery and dining hall were, however, common in Gothic times. With the advent of high, many-storied buildings, the need for lifts of a really adequate nature became apparent, though it is in the block of business premises rather than the domestic house that lifts are most frequently to be found. The public lifts on a large scale which carry thousands of people every day from the street level down to the "tubes" and back again have become so much a part of the scheme of things as almost to be accepted without comment. Lifts designed for practically every purpose for which they are used are to be seen at the Exhibition, many of them in working order.

MESSRS. MARRYAT & SCOTT, LTD. (28, Hatton Garden, E.C. 1) are exhibiting at Stall No. 157, Row H, their passenger and goods lift gears. The visitor is able to view a passenger car fitted with their improved safety gear, which is claimed to be the most perfect and efficient upon the market. This gear comes into action instantly upon the elongation of any one of the four suspension ropes, and is of particularly ingenious and robust design. Other exhibits include the firm's automatic push button equipment; car switch equipment; automatic gate-locking device, which is claimed to be the only perfectly safe lift gate lock; the Trip indicator recording the number, time and duration of every journey made by a lift. The firm are also exhibiting their patent luminous lift direction indicator, an ingenious patented adaptation of the Osglim Lamp, which indicates, by means of a luminous arrow, the direction in which the lift car is travelling.

MEDWAY'S SAFETY LIFT CO., LTD. (Stand No. 64, Row D), makers of "Britain's Best" electric lifts, have a very fine exhibit. The various improvements in electric lifts which this firm have, during recent years, put on the market, stamp them as a most progressive firm. They have on view an electric passenger-lift fixed ina special steel tower. It is fitted with car switch control, for operation by attendant, and can also be operated at will by automatic push button. A special de-celerator is fitted to ensure smooth stopping from high speeds. In addition, the lift is provided with Medway's patent safety locks and switches to all gates. Quite a novel feature is Medway's patent electric door-operating device. By simply pushing a button the doors or gates on both the cage and landing are automatically opened simultaneously. In a similar manner, by simply pressing a button the doors are closed. This device promises to become very popular, as it can be fitted to any lift where electric supply is available. An electric push button service lift is exhibited, the chief features of which are the compact gear and the "foolproof" automatic controller. This lift is in great demand for private residences. Medway's well-known hand-operated lift is also exhibited, over 4,000 of which the firm have fitted during the past 40 years. A special display board is also shown, with auxiliary parts of both electric and hydraulic lifts.

MESSRS. WAYGOOD-OTIS, LTD., of 45–55, Fetter-lane, E.C.4 (Stand No. 115, Row F.), are again showing a full-size passenger lift, capable of taking ten passengers at speed of 175 ft. per minute, running from the ground floor to the gallery. The lift is fitted in a self-contained steel structure, enclosed and fitted at each level with collapsible gates of top-hung pattern. The lift is arranged with special controlling apparatus so that it can be operated from inside the car. A dual control is provided enabling the lift by means of the operation of a change-over switch to be worked on the full automatic push-button system, with which arrangement the car can be called to a landing when no one is travelling in it by pressing a button fitted outside the enclosure. When the passenger enters the car it can be despatched to the required floor by pressing one of the buttons inside the car. A special device is provided so that when anyone enters the car the outside control is automatically cut out. When a passenger is in the car the collapsible gate at the car entrance must be closed before the lift can be started, but by a switching arrangement the empty car can be called to a floor whether the car gate is open or closed. The landing gates are fitted with interlocking gear designed so that the lift cannot be started unless the gates are shut and the gates cannot be opened until the car arrives at the floor. The car is fitted with a safety gear set so that if the car should descend at an excessive speed the gear will arrest the descent of car without undue shock. A new design of indicator is provided in the car to call the attention of the attendant from the landings. A flash-light position indicator is shown on the outside of the enclosure at each landing to indicate the position of the lift in the shaft and also to show whether the lift is ascending or descending. Direction light indicators are also provided over the gateways, so that where a number of lifts are arranged in a battery, it is possible to locate the lift which is travelling in the required direction. A new feature is an illuminated threshold to the lift car, so that a passenger stepping into the lift can see the exact position of the floor. There is also shown a range of eight various sizes of machines, from a small electric service lift gear designed for load of 40 lbs. at speed of 100 ft. per minute, up to the largest size, which will carry 20 cwts. at a speed of 400 ft. per minute. Among the subsidiary exhibits are a series of standard controllers, a working model of an electric push-button lift, a working model of one of a light electric service lift, hand-power lifts, and a number of fittings and accessories.



The Stand of Messrs. Waygood-Otis, Ltd.

BRICKS, STONE, MARBLE, &c.

In spite of the many new materials now being produced and experimented with in different parts of the country, bricks still hold their own in popular favour, notwithstanding the great increase in prices since 1914. Prices for substitute materials naturally tend to mount up to a level approaching that of the old accepted standard material, for something has to be allowed for legitimate profit to the promoter and inventor, whereas, in the case of bricks, the inventor has already received all the profit he is going to get, and need no longer be considered. In this inclement climate, where added pigment is subjected to a very severe test, a material that carries its own colour in its proper substance stands at a premium; and very admirable colour harmonies can be composed by the wise selection of bricks from the stocks of those manufacturers who make a speciality of fine appearance. Stone shares with brick the quality of good colour permanently ingrained in the particles of the material, and, like brick, wears into greater beauty in process of time.

Some marbles may be selected which stand the weather, but in the British Isles most marbles are more wisely kept under cover to avoid the bleaching and disintegrating effects of our acid-laden air. In the use of marble the traditions of the Byzantine craftsmen may be followed with safety, especially in their use of comparatively small slabs sawn and reversed to produce symmetrical patterns of veining.

Large slabs used as vertical wall-lining, unless of very great thickness, have the serious disadvantage of bending under their own weight and losing their surface particles and polish, even if no fractures result. Where large slabs are required it is good economy to see that their thickness is great in proportion and that they are well cramped at all edges to the walls they adorn. Used in solid shafts and blocks, marble of good quality can be made to sustain heavy loads and lends itself to the finest kind of architectural work, where structure decoration and colour combine to build up a beautiful effect.

The exhibit of MESSRS. ANSELM ODLING & SONS, LTD. (132, New North-road, London, N.1) on stall No. 128, Row F, includes marble flooring, handsome marble buffet, marble doorway, marble wall lining, marble chimney pieces, marble pedestals, vases, &c., garden seats and ornaments, marble statuettes, and a large selection of various coloured marbles, suitable for marble wall lining and other purposes.

MESSRS. CARTER & CO., LTD. (Poole, Dorset), have an attractive exhibit of all classes of tile products so arranged that all the constituent parts have some bearing on one another, producing a homogeneous and pleasing effect. The exhibit includes suggestions for interior wall tiling in dull surface tiles, imparting a quiet and dignified effect suited to the interior of a restaurant or similar building. A series of new glazes, which have more variations of tone and a more interesting quality than ordinary matt surface enamels, and fire-place plinth, cornice and pilasters in a special con-

struction material known as "Stoneware," are also shown. The outer side of this portion of their exhibit shows their ordinary Anglo-Dutch frost-proof tiling which has become so popular for exterior work. Other exhibits include a hob fireplace surround of hand-painted tiles and one in mottled handcraft glazes; also a church tiling adaptable for other purposes where a rich effect is required.

A selection of bricks and tiles is used in the construction of the stand of MESSRS. W. H. COLLIER & CO., Mark's Tey, Essex (No. 176, Row J). The multi-coloured red facings are specially noticeable, and some excellent rustic hand-made sand-faced tiles are exhibited.

The stand of MESSRS. EASTWOODS, LTD. (Belvedere-road, S.E.1), is wholly constructed of materials of their own manufacture. The main façade of this building (Stand No. 121, Row F) consists of a segmental arch with pier abutments, constructed of Eastwoods' "Conyer" machine-made stocks and red facings. The various parts of the stand display the appearance of this well-known firm's Shoeburyness hand made stocks and red brick dressings, Halstow machine-made stocks, Flettons, and concrete partition slabs. In addition to this practical demonstration there are also on view samples of land drain-pipes and breeze bricks, and a general exhibit of building materials.

The exhibit of the EMPIRE STONE CO., LTD., of Thanet House, Strand, W.C. (Stand No. 107, Row E), is a structure in the form of a summer house built of "Empire" stone to match Portland stone, portions of the work being carved. This stone, which is used for general building work, such as cinemas, theatres, offices, hospitals, schools, factories, &c., is manufactured in colour and texture to match any natural stone, and the excellent results obtained in this direction may be clearly seen. Samples of "Empire" stone steps, paving slabs, kerb, channel and reinforced concrete fence posts are also shown. The artificial stone manufactured by this firm is claimed to be not only as durable but cheaper than natural stone.

A large selection of "Hempstead" bricks and partition blocks are to be seen on the stand of the HEMEL HEMPSTEAD PATENT BRICK CO., LTD., of Hemel Hempstead (No. 207, Row H).

MESSRS. W. T. LAMB & SONS, of 43, Shoe-lane, E.C., are showing a selection of building materials (of which they are the manufacturers or agents) on Stand No. 209, Row H. The stand takes the form of a garden wall with doorway, in which various bricks and tiles are effectively displayed.

At No. 119, Row F, the PRESSED BRICK-MAKERS' ASSOCIATION, LTD. (Southampton-row, Kingsway, London), show miniature machinery of the Whittaker type, showing a grinding pan and press in operation,, so that it is possible to see in actual working the two most important features in the manufacture of the noted Fletton brick.

Specimens of Stancliffe (the original Darley Dale stone) and Hall Dale stone, both in the rough state and masonry dressed, are amongst the exhibits of the STANCLIFFE ESTATES CO., LTD. (Darley Dale). An office, erected on the stand (No. 93, Row E), is built up in coursed wallstone, showing various classes of dressing, and having a portico supported by circular columns. There are also examples of turned balusters and grindstones for grinding wood-pulp, engineers' tools, augurs and forks. The firm are further exhibiting a reinforced stone column and wall constructed on Mortons' patent system.

A brick pavilion was the attraction at the stall (Nos. 188 and 189, Row J) of MESSRS. THE SUSSEX BRICK & ESTATES CO., LTD., of 52, North-street, Horsham. The pavilion has been specially designed to demonstrate what great strength and true alignment, artistic effects and pleasing tints, can be obtained by using the firm's Weald clay bricks.

MESSRS. PERCY C. WEBB, LTD., marble merchants, of St. Katharine Docks, London, are again represented this year, their stand being No. 177, Row J. The features of this year's attractive exhibit are Rosso Antico, the red marble of the ancient Greeks and Romans, and Bryscom, the new building stone. At one end of the stand is shown a wall-lining, with pilasters and frieze, in which this rare red marble, Rosso Antico, has been incorporated with the Blancil Black and Tula Vein marbles. A Rosso Antico pedestal suitable for a bust or electric lamp is shown with a flower vase and pedestal in the same marble. The effectivenesss of Bryscom walling is shown in a porch with doorway, and from this example the scope which Bryscom offers in cottage, bungalow, and church designing will be readily appreciated. There is no limit to the size of building for which the stone can be used. The exhibition wall is built of worked stones in courses of an average thickness of five inches while the doorway is fitted with fine-axed jambs and lintel. The roofing is of picturesque tile-stones quarried in the same locality as Bryscom. The possibilities of Bryscom as a decorative marble are clearly shown in a polished pedestal; here the richly brecciated pattern is displayed to full advantage. It is interesting to note that Bryscom has been proved to retain its polish for a much longer period than most coloured marbles. Over two years ago a Bryscom stallboard was fixed in an exposed position at a seaside resort of the West, and to-day this fitting is as bright and fresh as it was when fixed. A wide range of smaller specimens of British and foreign marbles are on the stand. The whole exhibit is mounted on a fine-tiled flooring in Sicilian marble with "dots" in several choice coloured marbles. Some decorative onyx lamps and alabaster electric light bowls are also shown.

REINFORCEMENT FOR CONCRETE.

A whole library of descriptive and laudatory literature has grown up concerning the architecture of Gothic cathedrals with their expression of an exclusively compressive system of construction, although the judicious use of tensile members might have saved many of these buildings from premature ruin or permitted of their construction with even less expense of material. Re-inforced concrete has the merit of pressing into service all the resources of mechanical science in the creation of constructional form. Strength in compression in tension and in cross and shearing stress are all at the command of the designer in this material. Added to these advantages is that of continuity of surface and composition, which gives it a great increase of mechanical strength over that possessed by other materials which have to be used in the shape of beams or blocks. To take advantage of all the scientific possibilities of strength in reinforced concrete it is necessary to have at command reinforcement of suitable character for use in all required positions. All sorts of materials have been used in times past from old wire rope to hoop iron, and many very varied forms of reinforcement are on the market to suit the requirements of different classes of structure whether temporary or permanent.

The quality of holding tightly in the concrete is aimed at in several specimens, while facilities for speedy erection are made a feature of others.

A third group has been invented in response to the desire to minimise the need for temporary shuttering and forms a contribution to rational economy of time and labour in constructional operations.

When used in a scientific fashion reinforcement gives additional strength to a structure out of all proportion to its bulk, and the many exhibits on the stalls will be eagerly examined by all who are interested in modern methods of construction.

Although the field of employment for reinforced concrete construction is constantly widening, there can be no claim that it has been completely covered. The BARB ENGINEERING CO. (5, Victoria-street, Westminster, London, S.W.1) are drawing attention at their stall (No. 33, Row B) to their "Wonpees" reinforcements. "Wonpees" fabric is a continuous roll of jointless reinforcement. It is manufactured from bright hard-drawn steel wire of high elastic limit with a tensile strength of 35–40 tons per sq. in. The longitudinal wires are correctly spaced and held in position by transverse wires. At all points where the wires cross they are formed into one homogenous mass by a special process by which the fibre of the steel is not disturbed, weakened, or destroyed. It is claimed that the "Wonpees" method of manufacture purifies and improves the metal at the points of intersection, thereby ensuring a high tensile strength at these points. It is made in 1½ in. and 3 in. mesh of equal area per ft. width of cross section with transverse wires correctly spaced at standard intervals

MESSRS. BROWN & TAWSE, LTD., 3, London Wall-buildings, London, E.C.2, are again displaying at Gallery Bay No. 20 their well-known specialities for reinforcements, namely:—B. & T. special road reinforcement known as B. & T. No. 8F. It shows a road reinforcement, and consists of a square mesh of wires of equal strength that when embedded in the concrete ensures the reinforcement being equally distributed. Examples are also shown of B. & T. reinforcements for concrete culverts, tanks, walls, roofs, floors, and similar constructions; B. & T. reinforcements for beams, columns, pile frames, fence posts, &c., showing the B. & T. method of ensuring correct spacing of links.

THE BRITISH REINFORCED CONCRETE ENGINEERING CO's exhibit consists of a large number of photographic enlargements, illustrating building work and road work in which this system of construction has been used. These photographs cover every description of work, and they are taken from all parts of the country. Photographs of work abroad are excluded, although large quantities of the company's material are exported for buildings and roads in the Colonies and in foreign countries. The exhibit includes a sample column, a sample beam, and a sample slab; the particular feature of the beam is that stirrups are supplied in large units, the portions of each unit being physically connected. It is noted that B.R.C. columns consist of plain bars fitted with B.R.C. hoops and helicals, and B.R.C. beams of plain bars fitted with B.R.C. grouped stirrups. B.R.C. slab reinforcement is the well-known B.R.C. fabric. A sample of this material is shown waved or bent in the manner required in floor reinforcement. A tool has now been perfected for carrying out this waving accurately and economically, and the patent rights are held by the British Reinforced Concrete Engineering Co, Ltd. The use of the tool greatly increases the accuracy of reinforced concrete construction, and saves a large amount of cost to the contractor in fixing floor reinforcement. The municipal section of the exhibit is represented by a concrete slab showing the use of B.R.C. Fabric in road reinforcement. The firm's address is 1, Dickinson-street, Manchester, and they are located at Gallery Bays Nos. 1 and 20.

The stand of the CONCRETE UTILITIES BUREAU, of 35, Great St. Helens, E.C.3 (No. 110, Row F), should be visited by all interested in the many uses of concrete. This Bureau is an organisation for advocating and encouraging the use of concrete, and free literature on the manifold uses of concrete is being distributed. Books relating to concrete construction and concrete roads are also on view.

The EXPANDED METAL CO., LTD., York Mansion, Petty France, Westminister, S.W.1 patentees and manufacturers of expanded metal and engineers for all forms of reinforced concrete work, &c., occupy Stand No. 141, Row G. The exhibit consists of samples of the Company's products and examples of their uses; also photographs of various works carried out on its systems; expanded steel sheet reinforcement for concrete, which has been used extensively during the past 30 years in roads, foundations, walls, floors, roofs, bridges, culverts, silos, &c. A feature is the Rotary Diamond Mesh Expanded Steel—a new product. This material is a specially suitable reinforcement for concrete

roads, foundations and the like. It is supplied in sheets of practically any length, by 3 ft., 3 ft. 1½ in., 4 ft. and 4 ft. 1½ in. wide. The longer sheets are supplied in coils and are thus more easily handled in connection with road work. There are also expanded metal lathings, both for interior and exterior plaster work, in house and other construction, and "Exmet" reinforcement for brickwork, concrete-block work, &c. This material has been used extensively as a reinforcement for concrete kerbing. The exhibit includes also, mild steel wall-ties for cavity walls, and a few examples of concrete reinforced with expanded metal.

MESSRS. JOHNSON'S REINFORCED CONCRETE ENGINEERING CO., LTD., of Lever-street, Manchester, are displaying their specialities on two stands. On Stand No. 114, Row F, are shown lattice steel wire reinforcement, for concrete floors, roofs, walls, tanks, culverts, and roads; "Keedon" fitments, for reinforced concrete beams, columns, &c.; "Bricktor," a reinforcement for brickwork, partition slabs, concrete block work, &c.; and hollow tile flooring. constructed in position without the use of centering. On Stand No. 22 in the Gallery the firm is showing specimen rolls of steel wire lattice of strengths usually adopted in the construction of concrete roads. In this reinforcement the edges are knuckled over and left smooth, and thus do not damage other material in the vicinity, or cause injury to workmen when handling; it is made and delivered in sizes as required. A display of photographs is exhibited showing examples of recent roads where the material has been employed. These reinforcements are now well known and their extensive use is demonstrated by series of photographs on both stands.

THE WALKER-WESTON CO., LTD (Empire House, 7, Wormwood-street, London, E.C.2) are showing at Gallery Bay No. 7 the Walker-Weston (patent) interlocked double-layer Reinforcement for roads and foundations. This system of reinforcement was used by the Port of London Authority in 1917 on the new developments at Royal Albert and Victoria Dock, and has since been used by many leading corporations and councils, including Ministry of Transport, Middlesex County Council, Harland & Wolff, Ltd., Middlesbrough Corporation, Watney, Combe, Reid & Co., Somersetshire County Council, Belfast Tramway Company, Manchester Corporation, &c., in every case with satisfactory results. The reinforcement provides against all the stress imposed upon a modern heavy traffic road or foundation. As every engineer knows, concrete is so weak in tension that it becomes necessary to embed steel in the concrete to make up for its deficiency in tensile strength. With the use of the Walker-Western reinforcement it is possible suitably to reinforce concrete rafts not only against tensile stress, but for the equally important shear and contraflexure stresses. This is achieved by the double-layer framework in which the diagonal wires connecting the two layers serve as shear members, whilst the top and bottom layers provide the necessary tensile resistance for the stresses due to contraflexure and flexure. The reinforcing framework is so rigidly constructed that the concretors may tread on it without displacing any of the component bars or injury to the framework. It has been extensively used for all classes of reinforced concrete work, including quay and platform walls, roads of large magnitude, floors, culverts, &c., and can be adapted to any form of construction. The exhibits consist of slabs, showing reinforcing framework in position, suitable for concrete roads, foundation work and walls, and a collection of fine photographs of concrete surface roads and foundations carried out by the Walker-Weston patent system.

SANITARY APPLIANCES.

The last half-century has been identified with a forward policy in regard to sanitation and sanitary fittings. Experiments have been conducted with different methods of sewage disposal, and the bacteriological processes of sewage purification have been discovered and adapted to general use. Principle and practice have gone hand-in-hand in the development of parts of great schemes until the water-borne system may claim to have received highly specialised scientific attention in every detail. Pipes, bends, and junctions devised for positions where they will rarely or never be seen embody some very pretty modelling, equally as artistic as suitable; and in some anti-splash channel connections the plastic art of the potter approaches again to the ancient Greek sense of fitness in modelled curvature exhibited in urn and terra-cotta antifixal ornament. Men have been in earnest about sanitation, and the results testify to their intelligently directed zeal. Fittings above ground have also been produced of late years in a fashion which deserves to be qualified by the word "sanitary," since a rational regard for health has had a place in their design. The printed patterns which were capable of hiding traces of dirt on earlier productions have been abandoned in favour of simple enamels of white or self-colours, striking the keynote of cleanliness. At the same time the shapes have been modified to eliminate dusty ledges, dirt-collecting mouldings, and "ornament." An attempt is being made to do away with household drudgery in the cleaning of pipes and taps, and these may now be had with enamelled surfaces to match the porcelain or porcelain-enamelled sanitary fittings. Cleansing the odd-shaped space between bath and wall still involves some difficulty in small houses, for only very expensive baths have an apron-piece enclosing the bath and shutting the space away from the housewife's care. A solidly-built enclosure surrounding the bath and faced with tiles after the manner of a Spanish garden seat might meet the artistic and hygienic aspects of the case. In addition to a great variety of baths, lavatory basins, sinks, &c., suitable for small houses, the stands of the leading firms are notable for some very fine exhibits, both in design and workmanship.

As is usual at these exhibitions, MESSRS. DOULTON & CO., LTD., of Albert Embankment, Lambeth, S.E. 1 (Stand No. 132, Row G), have a very attractive and comprehensive display of all descriptions of sanitary appliances. A feature of the display is a series of bathrooms which are fitted up complete with bath, lavatory, w.c., and all necessary accessories. The bathrooms occupy about one half of the stand, the remainder being devoted to a general selection of appliances. Especially noticeable are the coloured "Keramos" lavatories, which are particularly pleasing in appearance, and as they can be made in colour to suit any scheme of decoration they are specially suitable for bedrooms and dressing rooms. The basin has a flat table top at the back, which makes it a convenient standing place for toilet requisites, &c. The "Ideal" lavatory is of the same type as the coloured "Keramos," but made in white glazed Vulcanware. Other lavatories of different designs are shown in "Queensware," and a selection of different kinds of hardware polished marbles. Interesting items are the "Lambeth" Vulcanware sinks, the deeper ones having two soap trays, and the shallower ones, without overflows, with a single soap or brush tray. The trays are part of the sink itself, which eliminates the separate wood or zinc soap tray. There is also shown a large range of water closets. Overhead cisterns and the "Compact" pattern cistern are exhibited, and also a few types of flushing valves. The latest one is the "London," which is approved by the Metropolitan Water Board. Four sectional cast-iron w.c. cisterns and several sections of brass screw-down and "press" lavatory taps and mixing valves show the actual working parts of these appliances; and a patent w.c. cistern silencer is on view. The various pottery and metal fittings shown are designed to require the minimum of cleaning. Of special interest to those who have no room for a fixed lavatory in the bathroom is "Barr's" bath basin, an adjustable removable bowl which rests on four wooden rollers on the rim of the bath; the basin is of enamelled iron and supported on a telescopic stand which acts as the waste, and can be adjusted easily so that it can be fixed at three different heights.

Many corporation housing schemes are adopting the "HURRY" WATER HEATER CO.'S system (39, Broad-street, Birmingham; Stand No. 226, Row L). The firm have on view a large and varied assortment of their heaters which have been supplied to the following housing schemes:—Croydon Corporation (400 heaters), Mitcham (300), Slough (300), Nottingham (new order for 600 more), Loughborough, Stourbridge, Brierley Hill, Sutton Coldfield, Widnes, &c. Included on the stand are several "Hurry" furnaces that supply hot water to a bath, also for boiling clothes.

The comprehensive exhibits of MESSRS. MOULE'S PATENT EARTH CLOSET CO., LTD. (1½, Guilford-street, Gray's Inn-road, London, W.C. 1), at Stand No. 78, Row D, embrace sanitary closets in various designs, suitable for adoption in all contingencies, for use in the house, bed-room, bathroom, and in the garden. In either position they can be installed with the fullest confidence, being hygienic and quite odourless. The principle of the earth system is founded on the now well-known power possessed by dry earth of deodorising and disinfecting fæcal matter.

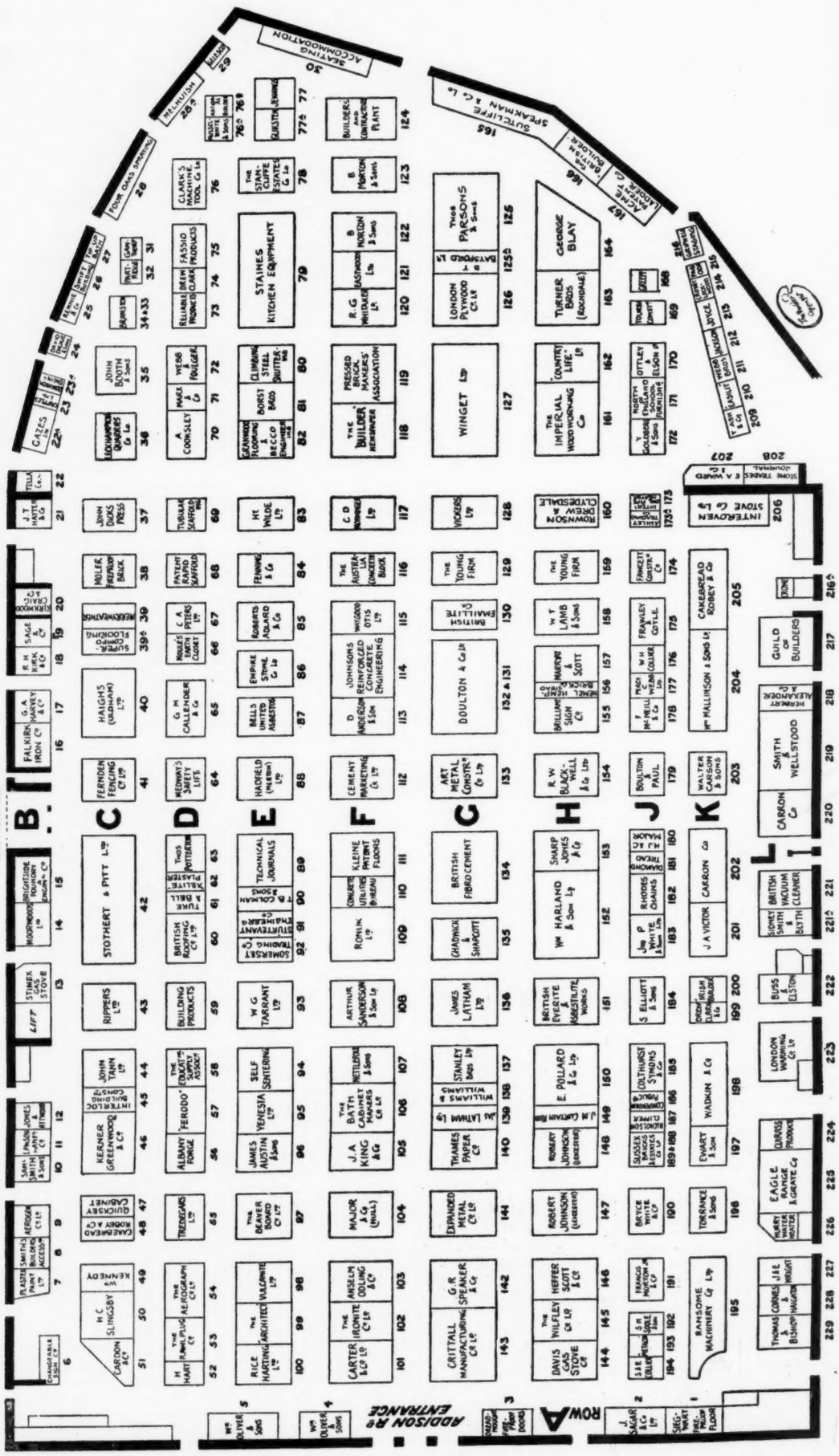
The PATENT TIP-UP BATH CO., Bath House, Broad-street, Birmingham, are exhibiting, at Stall No. 27, Row B, Darby's patent unbreakable tip-up baths. As these are well riveted along the waste section they are extra strong. This section can be made in strong sheet copper, if specified. The exhibit shows a Darby bath fitted with a water heater so that the bath can be lifted up when out of use. These have been fitted in back bedrooms in position of a fireplace, the bath falling towards the door when in use does not spoil the bed space. Another bath is shown, suitable for good class flats or bungalows, with plated tube waste, and plated towel rail attached to the feet. This class is made in 5 ft. 6 in., with lip at foot-end to receive hot and cold taps, enamelled white inside and dark green outside, or aluminium inside and outside.

ACCESSORIES.

In addition to a display of a variety of "Anchor" cords, such as sash cords, Venetian cords, glacie lines, picture cords, halyard and log lines, indicator cords, &c., MESSRS. JAMES AUSTIN & SONS, LTD., of Hoxton-square, N.1 (Stand No. 96, Row E) are showing solid braided cotton and waterproof cords for tramway trolley cords, clothes lines, lift ropes, &c. The application of these cords is demonstrated by means of working models. The various uses of the products of the firm, and the chief causes of trouble with windows and blinds and the remedies, are shown in a practical manner.

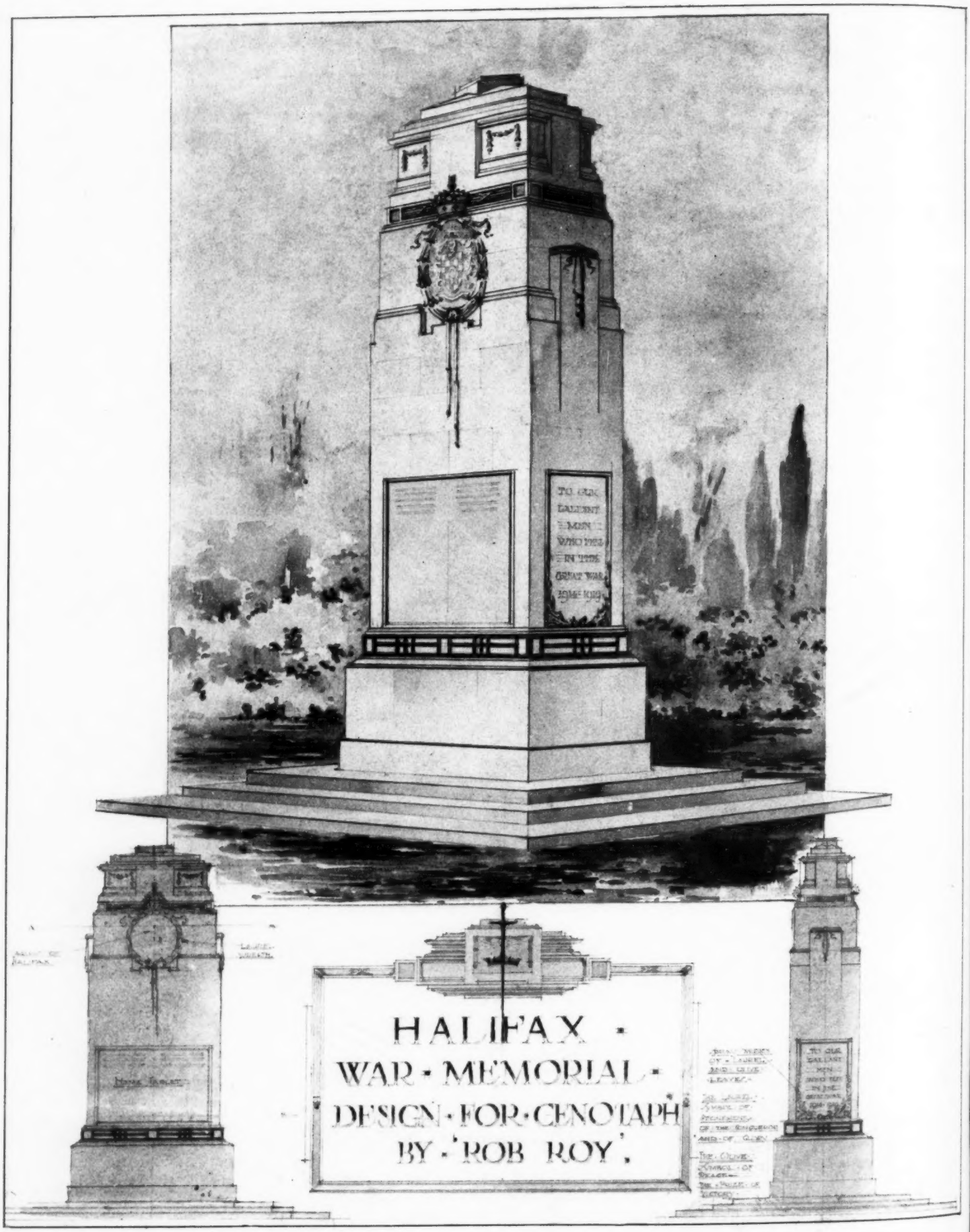
MESSRS. FERODO, LTD. (Sovereign Mills, Chapel-en-le-Frith) are exhibiting at Stand No. 57, Row D, specimens of their "Ferodo" patent stair treads and "Feroleum" nosings. These treads and nosings are manufactured in three types, three colours, and in two thicknesses, of specially-woven cotton, and bonded by a special method, and are of the same quality throughout. They are supplied to fit steps of any size in wood, stone, iron or marble. These products are a development of this firm's well-known brake-linings and clutches, and incorporate their non-slipping qualities. Other specialities shown include a stair-tread dressing (which can be applied to natural-coloured treads to match any colour scheme) and fibrous flooring, which can be obtained in seven colours, either plain or corrugated.

MR. H. HART (29, Settles-street, London, E.) is showing on Stand No. 59, Row D a selection of drain-clearing machines and tools fitted with screw joints. A patent swivel collar locking joint having no springs, projections or pins is exhibited; the locking is effected by turning the collar. Three-feet flexible spring steel rods, which can be used in long lengths, and with which no brass connections are necessary, are also shown.

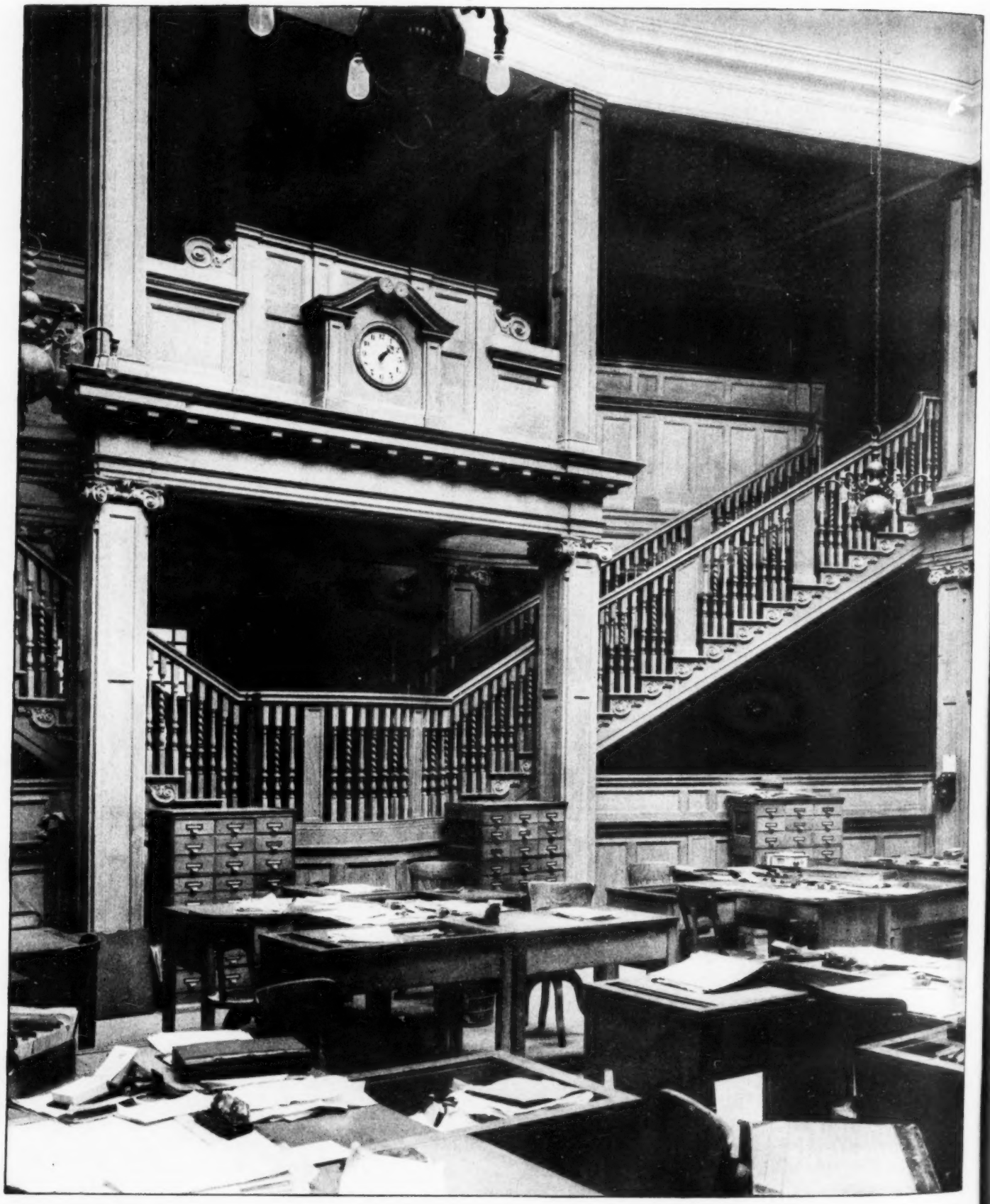


Plan of Ground Floor, Building Exhibition, Olympia.

London: Printed by THE PRESS PRINTERS, LTD., 69-76, Long Acre, W.C. 2, and Published by THE BUILDER, LIMITED, at 4, Catherine Street, Aldwych, W.C. 2.



FIRST PREMIATED DESIGN, BY MR. H. SCOTT DAVIES.



OPEN WELL AND STAIRS.

NEW OFFICES. LUTON. MESSRS. H. B. CRESWELL & W. A. FORSYTH. FF.R.I.B.A., JOINT ARCHITECTS.

FIREPLACE IN BOARDROOM.

NEW OFFICES, LUTON. MESSRS. H. B. CRESWELL & W. A. FORSYTH, FF.R.I.B.A., JOINT ARCHITECTS.

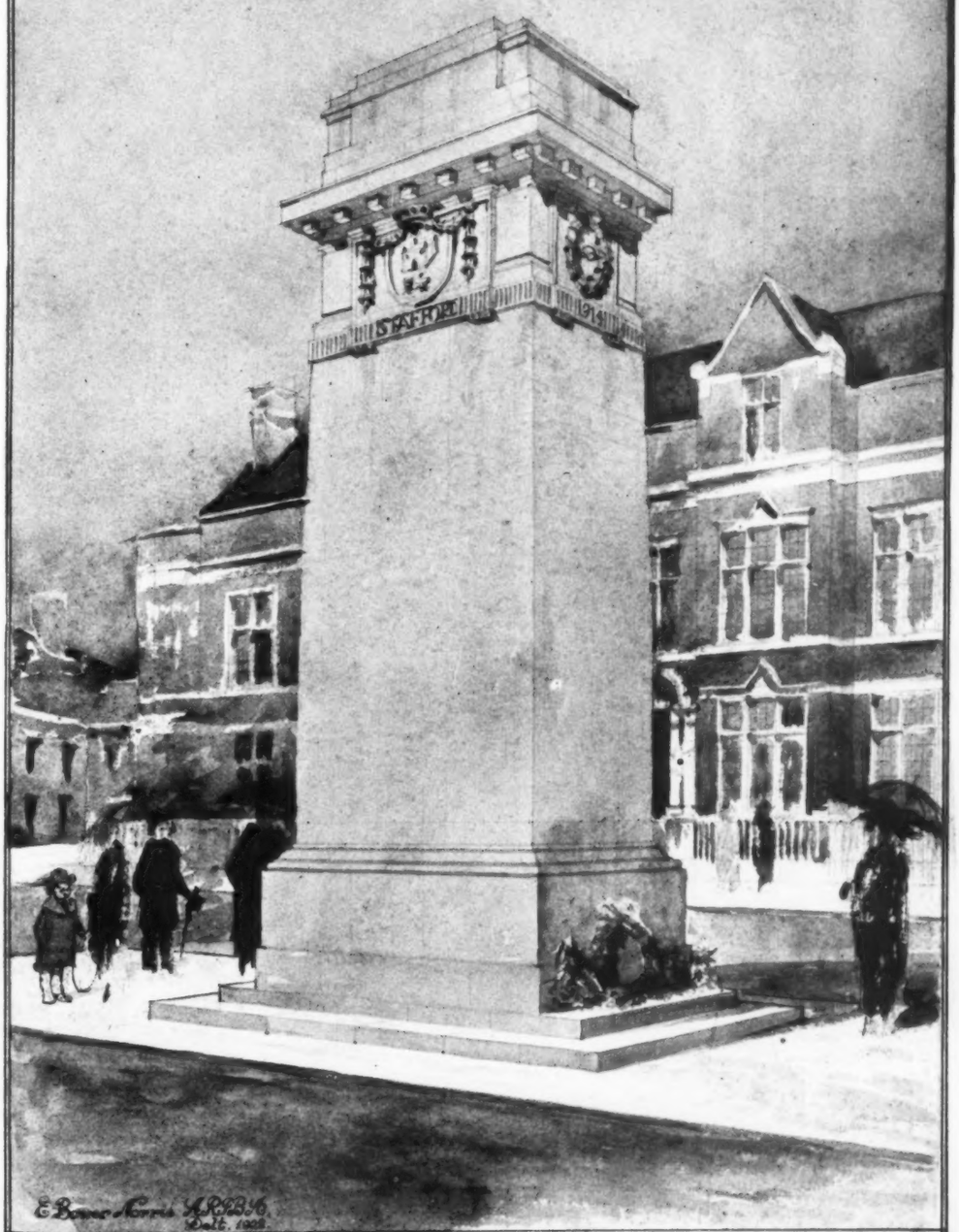
BOARD ROOM.

NEW OFFICES, LUTON. MESSRS. H. B. CRESWELL & W. A. FORSYTH, FF.R.I.B.A., JOINT ARCHITECTS.

APPROACH TO STAIRS.

NEW OFFICES, LUTON. MESSRS. H. B. CRESWELL & W. A. FORSYTH, FF.R.I.B.A., JOINT ARCHITECTS.

BOROUGH WAR MEMORIAL
STAFFORD



The Site Proposed is in front of the City School of Technology.

SANDY & NORRIS F.A.R.I.B.A.
C.W. MILLER M.S.A.
ASSOCIATED ARCHITECTS
STAFFORD JANUARY 1922.

To be Executed in the Portland Stone on a Foundation of Concrete.